TO MEET ASTM STANDARDS FOR COLD FLOW PROPERTIES
ColdClear®

Cold Clear

The ASTM D6751 Cold Soak Filtration Test is leaving many biodiesel producers and consumers “out in the cold.” In response, Schroeder Fuel Filtration is proud to present ColdClear®, a proprietary multi-stage separation technology designed specifically to ensure that biodiesel products conform to this ASTM standard for cold flow properties. The ColdClear® System consists of a three-stage bank of filters using a combination of filtration and adsorption principles to capture compounds that could cause plugging or crystallization in biodiesel fluids. Notably, ColdClear® is the first multi-stage treatment system for solving the cold soak filtration dilemma in B-100 biodiesel and biodiesel blends in a single pass.

The Cold Flow Dilemma

Fuel filter plugging, both in the ASTM procedure and in the field, has been researched significantly with a range of answers to the single question. Most producers and consumers assumed poor cold flow performance was due to feedstock issues, or even poor biodiesel quality. When data started coming in from biodiesel producers across the USA, the answer became even more confusing. A wide range of cold soak results were found for biodiesel samples from a wide range of feedstocks and an even wider range of producers. Obviously, the cold flow problem was not just quality or feedstock dependent.

Why Cold Soak Matters

Cold flow problems can cripple entire fleets during winter months, as evidenced by widespread reports regarding plugged fuel filters, plugged tank filters, and in some instances, even gelling in storage situations. The ASTM Test is performance-based, and designed to aid fleet managers in understanding the gelling potential of fuel during winter operation. Many researchers believed the key culprits were sterol glucosides and monoglycerides produced during the transesterification reaction. While these compounds were found to be in some samples, other biodiesel samples with low concentrations of these compounds were found to fail the cold soak test. In addition, many samples of biodiesel blends gathered due to plugging instances were found to have water and petroleum-based diesel contaminants on the filter.

Why ColdClear® is the Solution

Schroeder Fuel Filtration took this data into consideration in developing ColdClear®, a multi-stage filtration/adsorption system that ensures any potential factors that would initiate crystallization or plugging on the filter are dramatically reduced. By sequentially removing certain impurities that create a higher than normal likelihood of surface crystallization on the filter, our ColdClear® technology ensures that your biodiesel can meet the ASTM specification for cold soak filtration. It also ensures that fleet customers are receiving the very highest quality biodiesel and will minimize system plugging quality issues. ColdClear® is effective for B100 and a range of diesel blends, meaning that producers, distributors or even fleet consumers of biodiesel blends can use it.

The cartridges are disposable and easy to remove from the housings. The cartridges can be changed in minutes, which means very little downtime between production runs. Each bank of cartridges is rated to treat a fixed volume of B100 biodiesel, while biodiesel blends are scaled by the blend percentage.

All housings have the option for test points installed in the base. The first housing can be equipped with a visual or electrical differential pressure indicator. Because differential pressure is not a relevant indicator of life for the cartridges in the latter two housings, an indicator is not offered for stage 2 & 3 housings.
**ColdClear®** is a three-stage system with all filters mounted in series on a single skid. The first stage serves as a pre-filter and captures solid particulates down to three microns in size. Stages 2 and 3 utilize custom design elements that combine adsorption technologies with the proven effectiveness of Schroeder's high efficiency Excel-ZPlus® synthetic filtering media.

Multiple units can be employed in parallel to meet higher flow requirements. The ColdClear® System can be easily integrated into existing plant piping environments. If multiple units are required, Schroeder Fuels offers a range of monitoring options to ensure proper operation of the filter banks.

The essence of the ColdClear® technology is the removal of crystallization precursors from the biodiesel or biodiesel blend. Therefore, knowing the exact flow rate of your system is essential for the ColdClear® System to be properly sized and configured for a specific application.

In-plant treatment of biodiesel (B100) to conform to ASTM standards prior to blending or shipment. In-plant treatment of biodiesel blends (ex. B5, B10, etc) to ensure blended biodiesel meets or exceeds cold flow specifications. For use in diesel fuel storage and distribution systems where B100 or biodiesel blends are stored and distributed to ensure shipped blends conform to ASTM specifications. Large fleet terminals that have on-site diesel (and biodiesel blend) storage to ensure tight adherence to cold flow standards. Unit must be wet for at least 10 hours before use.

---

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BCC100</strong></td>
<td><strong>BCC300</strong></td>
</tr>
<tr>
<td>Flow gpm (L/min): 5 (19)</td>
<td>15 (57)</td>
</tr>
<tr>
<td>Throughput (gal): 15,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Max Oper Press psi (bar): 150 (10.3)</td>
<td>150 (10.3)</td>
</tr>
<tr>
<td>Oper Temp °F: 70 Optimal; Allowable 40-100</td>
<td>70 Optimal; Allowable 40-100</td>
</tr>
<tr>
<td>Element Bowl Material: Steel</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Porting Base &amp; Cap Mat’l: Cast Aluminum</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Element Change Clearance in (mm): 8.5 (215)</td>
<td>33.8 (859)</td>
</tr>
<tr>
<td>Pre-filter Cartridge P/N: BCCPREFILTER</td>
<td>BCC39QPRE</td>
</tr>
<tr>
<td>Polish Cartridge P/N: BCCPOLISH</td>
<td>BCC39QPOL</td>
</tr>
<tr>
<td>No. of Housings per Stage: 1</td>
<td>1</td>
</tr>
<tr>
<td>No. of Cartridges per Stage: 3</td>
<td>1</td>
</tr>
<tr>
<td>Cartridge Case Lot Qty: 12</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes:**

The above results are based on using the best feedstock available.
How to Build a Valid Model Number for a Schroeder BCC100:

<table>
<thead>
<tr>
<th>BOX 1</th>
<th>BOX 2</th>
<th>BOX 3</th>
<th>BOX 4</th>
<th>BOX 5</th>
<th>BOX 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC100</td>
<td>V</td>
<td>P16</td>
<td>D5C</td>
<td>UU</td>
<td></td>
</tr>
</tbody>
</table>

Example: NOTE: One option per box

BCC100VP16P16D5CUU = BCC100VP16P16D5CUU

Filter Series

- BOX 1: BCC100
- BOX 2: V = Viton®

Seals

- BOX 3: P16 = 1” NPT
- BOX 4: F16 = 1”SAE 4-bolt flange code 61

Inlet Porting

- BOX 5: D5 = Visual Pop-up
- BOX 6: DSC = Visual Pop-up in cap
- MS10 = Electrical w/ DIN connector (male end only)

Outlet Porting

- BOX 5: F16 = 1”NPT
- BOX 6: F16 = 1” SAE 4-bolt flange code 61

Test Points

- BOX 5:
- BOX 6: UU = Test Points in all housings

Dirt Alarm®

- BOX 5:
- BOX 6: Omit = None

NOTES:

- Option UU is not available with D5 or MS10 indicator
- Box 2. Viton® is a registered trademark of DuPont Dow Elastomers

BCC100 - BCC100 Series

ColdClear® BCC100 Series Replacement Cartridges

Stage 1 Cartridge (3 required)

Performs micronic pre-filtering to protect ColdClear® cartridges

Stage 1 Cartridge:

Stage 2 & 3 Cartridges:

BCC100 - BCC100 Series

Dimensions shown are inches (millimeters) for general information and overall envelope size only.
For complete dimensions please contact Schroeder Industries to request a certified print.

Metric dimensions in ( ).

Option UU is not available with D5 or MS10 indicator

Box 2. Viton® is a registered trademark of DuPont Dow Elastomers
**ColdClear® BCC300 Series**

**How to Build a Valid Model Number for a Schroeder BCC300:**

<table>
<thead>
<tr>
<th>BOX 1</th>
<th>BOX 2</th>
<th>BOX 3</th>
<th>BOX 4</th>
<th>BOX 5</th>
<th>BOX 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC300</td>
<td>V</td>
<td>P32</td>
<td>P32</td>
<td>D5C</td>
<td>UU</td>
</tr>
</tbody>
</table>

**Example:** NOTE: One option per box

BCC300 – V – P32 – P32 – D5C – UU = BCC300VP32P32D5CUU

**Filter Series**

Box 1: ColdClear® BCC300 Series

**Seals**

Box 2: V = Viton®

**Inlet Porting**

Box 3: P24 = 1½" NPT

**Outlet Porting**

Box 4: P24 = 1½" NPT

**Dirt Alarm®**

Box 5: Omit = None

**Test Points**

Box 6: UU = Test Points in all housings

**Notes:**

Box 2. Viton® is a registered trademark of DuPont Dow Elastomers

Stage 1 Cartridge: BCC39QPRE

Stage 2 & 3 Cartridges: BCC39QPOL

Dimensions shown are inches for general information and overall envelope size only. For complete dimensions please contact Schroeder Industries to request a certified print.

Metric dimensions in ( ).

NOTES:

---

BOX 1 BOX 2 BOX 3 BOX 4 BOX 5 BOX 6
BCC300 V P32 P32 D5C UU = BCC300VP32P32D5CUU

**Filter Model Number Selection**

**Replacement Cartridges**
Replace Cartridges

Stage 1 Cartridge: BCC39QPRE
Stage 2 & 3 Cartridges: BCC39QPOL

**ColdClear® BCC900 Series**

**How to Build a Valid Model Number for a Schroeder BCC900:**

<table>
<thead>
<tr>
<th>BOX 1</th>
<th>BOX 2</th>
<th>BOX 3</th>
<th>BOX 4</th>
<th>BOX 5</th>
<th>BOX 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter Series</td>
<td>Seals</td>
<td>Inlet Porting</td>
<td>Outlet Porting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCC900</td>
<td>V = Viton®</td>
<td>P48 = 3&quot; NPT</td>
<td>P48 = 3&quot; NPT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dirt Alarm®**

- Omit = None
- RD5 = Visual Pop-up
- DPG1 = Differential Pressure Gage
- RMS10 = Electrical w/ DIN connector (male end only)

**Test Points**

- Omit = None
- UU = Test Points in all housings

**NOTES:**

1. Box 2. Viton® is a registered trademark of DuPont Dow Elastomers.
2. Metric dimensions in ( ).
3. Dimensions shown are inches for general information and overall envelope size only.
4. For complete dimensions please contact Schroeder Industries to request a certified print.
How to Build a Valid Model Number for a Schroeder BCC1200:

Example: NOTE: One option per box

<table>
<thead>
<tr>
<th>BOX 1</th>
<th>BOX 2</th>
<th>BOX 3</th>
<th>BOX 4</th>
<th>BOX 5</th>
<th>BOX 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC1200</td>
<td>V</td>
<td>P48</td>
<td>P48</td>
<td>RD5</td>
<td>UU</td>
</tr>
</tbody>
</table>

= BCC1200VP48P48RD5UU

Filter Series | Seals | Inlet Porting | Outlet Porting |
--------------|-------|---------------|---------------|
BCC1200 | V = Viton® | P48 = 3” NPT | P48 = 3” NPT |

Dirt Alarm®

Omit = None
RDS = Visual Pop-up
DPG1 = Differential Pressure Gage
RMS10 = Electrical w/DIN connector (male end only)

Test Points

Omit = None
UU = Test Points in all housings

NOTES:

Box 2. Viton® is a registered trademark of DuPont Dow Elastomers

Stage 1 Cartridge: BCC39QPRE
Stage 2 & 3 Cartridges: BCC39QPOL
ColdClear® BCC1500 Series

Filter Model Number Selection

Filter Series
BCC1500

Seals
V = Viton®

Stage 1 Cartridge: BCC39QPRE
Stage 2 & 3 Cartridges: BCC39QPOL

How to Build a Valid Model Number for a Schroeder BCC900:

Example: BCC1500VP48P48RD5UU

Box 5
Dirt Alarm®
Omit = None
RD5 = Visual Pop-up
DPG1 = Differential Pressure Gage
RMS10 = Electrical w/ DIN connector (male end only)

Box 6
Test Points
Omit = None
UU = Test Points in all housings

Box 2
Seals
V = Viton®

BOX 1 BOX 2 BOX 3 BOX 4

BOX 1 BOX 2 BOX 3 BOX 4 BOX 5 BOX 6

Inlet Porting
P48 = 3" NPT
A48 = 3" ANSI 150# Flange

Outlet Porting
P48 = 3" NPT
A48 = 3" ANSI 150# Flange

NOTE: One option per box

NOTE: Box 2. Viton® is a registered trademark of DuPont Dow Elastomers

Replacement Cartridges

Metric dimensions in ( ).
Dimensions shown are inches for general information and overall envelope size only.
For complete dimensions please contact Schroeder Industries to request a certified print.

NOTE: One option per box

NOTE: Box 2. Viton® is a registered trademark of DuPont Dow Elastomers

Dimensions shown are inches for general information and overall envelope size only.
For complete dimensions please contact Schroeder Industries to request a certified print.

NOTE: One option per box

NOTE: Box 2. Viton® is a registered trademark of DuPont Dow Elastomers